

Implementation of Safe Sleep Practices by Mothers with 0-1 Year-Old Infants

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ABSTRACT

Aim: The sleep environment of an infant affects the likelihood of sudden infant death syndrome and other sleep-related infant deaths. This study was performed to determine the safe sleep practices of mothers with 0–1 year-old infants.

Methods: This descriptive study included 204 mothers with 0–1 year-old infants who visited family health centers between October 30 and December 28, 2018. The data were collected using a questionnaire form and evaluated using the number, percentage, mean, standard deviation, and chi-squared test.

Results: The mean age of the mothers was 28.48 ±5.83 years; 43.1% were primary school graduates and 84.8% were housewives; 53.9% of the infants were girls and 39.2% were 0–3 months old. It was found that 47.5% of the mothers put their infant to sleep in the supine position, 46.1% in the non-supine position, 70.1% on a soft bed, and 76.5% by using a pillow. In addition, 41.2% of the mothers stated that they used pacifiers while putting their infant to sleep, 9.8% stated that they slept in the same bed with their infant, and 92.9% stated that they slept in the same room.

Conclusion: It was determined that the mothers performed certain risky practices related to the sleep environment, particularly regarding soft beds' use, sleeping positions, pillow use, and bed-sharing. It may be recommended that healthcare professionals play an active role and take responsibility in increasing the level of knowledge and awareness of parents regarding safe sleep.

Keywords: sleep, infant, mothers, family practice

Date of submission: 05.01.2021 / **Date of acceptance:** 02.06.2021

How to cite: Yildiz I. The implementation of safe sleep practices by mothers with 0-1 year-old infants. Euras J Fam Med 2021;10(2):56-64. doi:10.33880/ejfm.2021100203.

Conflict of interest: No conflict of interest was declared by the authors.

Financial disclosure: No financial disclosure was declared by the authors.

This study was presented as an oral presentation at the 2th International Pediatric Nursing Congress held in İzmir, Turkey between November 27-30, 2019.

Introduction

Sudden infant death syndrome (SIDS) is defined as sudden and unexpected infant death associated with accidental suffocation in bed and other unspecified sleep-related infant death (1). In 2017, there were approximately 1400 deaths due to SIDS, 1300 deaths due to unknown causes, and 900 deaths due to suffocation in bed, with a total of 3.600 sudden unexpected infant deaths in the United States (2). The infant mortality rate in Turkey is 11629 in 2018, and there is no data regarding sudden unexpected infant mortality rates (3).

Sudden infant death syndrome and other sleep-related infant deaths, also termed cradle/cot death, are associated with the infant's sleep environment (1). In the literature, it has been reported that factors related to the sleep environment such as sleeping position, use of soft beds, bed-sharing, smoking during pregnancy and in the postnatal period, and exposure of the infant to environmental cigarette smoke are associated with SIDS (1,4-10). A Centers for Disease Control and Prevention (CDC) report described that one-fifth of mothers (22%) did not lay their infant in the supine position, more than half (61%) shared the bed with their infant, and approximately two-fifths (39%) used soft beds (11). Studies conducted in Turkey have also revealed risky practices related to the sleep environment, such as laying the infant in the lateral position, using soft beds, using pillows, not using pacifiers, sharing beds, and smoking at home (12-20).

Sudden infant deaths that occur in an unsafe sleep environment are considered preventable (21,22). The American Academy of Pediatrics (AAP) has provided recommendations for a safe sleep environment to reduce preventable sudden infant deaths due to unsafe sleep environments. These recommendations include using the supine sleeping position, using a hard sleeping surface, avoiding soft objects in the cradle, and not sharing the bed with the infant. It was determined that the campaign for a safe sleeping environment that promoted the supine sleeping position significantly reduced SIDS-induced infant mortality (1,4,23). Sharing the same room but keeping

the beds separate is also recommended because room sharing provides the same benefits as bed-sharing in terms of a safe sleeping environment but reduces the risk of SIDS by 50% (22). Continuing breastfeeding is also recommended, which has a high priority in the list of safe sleep recommendations as it reduces the risk of SIDS; giving babies pacifiers during sleep after active breastfeeding is also recommended because it reduces the risk of SIDS by 50% – 90% (24,25).

Prevention or reduction of SIDS and other sleep-related infant deaths can be achieved through the compliance of parents, health professionals, and the community with safe sleep recommendations (1,22, 26). This study was conducted to determine the safe sleep practices of mothers. It is thought that the results of the study will contribute to the determination of the risky practices of mothers about the sleep environment of the infant and the measures that can be taken.

Methods

The population of this descriptive cross-sectional study comprised of mothers with 0-1 year-old infants registered at two family health centers located in the provincial center of Sivas, and the study sample comprised of 204 mothers admitted to the family health centers between October 30 and December 28, 2018, who agreed to participate in the study.

Data were collected using the introductory information form and safe sleep information form that was prepared by the researcher. The introductory information form comprised of 12 questions about the mother (age, education level, working status, family type, and the number of children) and the infant (sex, birth weight, and week of birth). Safe sleep information form comprised of 15 "Yes/No" questions on the knowledge and practices related to safe sleep, that were prepared by the researcher under the relevant literature (1,12-15,18,19). Before administering the questionnaires, the purpose of the study was explained by the researcher and the forms were completed in 8–10 min through the face-to-face interview with the mothers who agreed to participate in the study. Ethical approval was obtained from the ethics committee of Sivas Cumhuriyet University (dated 17.04.2019 and

numbered 2019-04/36) and institutional permission was obtained from the Sivas Provincial Directorate of Health. Written and verbal consents were obtained from the mothers.

IBM SPSS Statistics 22.0 software was used for data analysis. Data were presented as the number, percentage, mean, standard deviation, and Chi-square exact test. The value of $p < 0.05$ was accepted as statistically significant.

Results

Characteristics of the mothers' and infants' participating in the study are summarized in Table 1.

Table 1. Descriptive characteristics of mothers and infants

Descriptive characteristics	n	%
Mean age: 28.48 ± 5.83 (Min: 18, Max: 45)		
Educational status		
Illiterate	7	3.4
Primary School	88	43.1
High School	62	30.4
University	47	23.0
Working status		
Employed	31	15.2
Unemployed	173	84.8
Income level		
Low	11	5.4
Middle	188	92.2
High	5	2.5
Family type		
Nuclear	172	84.3
Extended	32	15.7
Infant's sex		
Girl	110	53.9
Boy	94	46.1
Infant's age (months)		
0-3 months	80	39.2
4-6 months	43	21.1
7-9 months	44	21.6
10-12 months	37	18.1
Birth week		
31-37 weeks	27	13.2
38 weeks or more	177	86.8

The age of the mothers ranged from 18 to 45 years, with a mean age of 28.48 ± 5.83 years. Of the mothers, 43.1% were primary school graduates, 84.8% were housewives, 92.2% were in the middle-income level, and 84.3% had nuclear families; the average number of children was 2.07 ± 1.09 . When the characteristics of the infants were evaluated, it was

found that 53.9% were girls and 39.2% were 0-3 months old. In total, 88.6% of the infants were born after 38 weeks of gestation with a mean birth weight of 3.141 ± 522.01 g.

Table 2 presents the practices of mothers related to the sleep environment.

Table 2. Mothers' practices for safe sleep environment

	n	%
In which position do you put your infant to sleep?		
Supine	97	47.5
Prone	5	2.5
Lateral	89	43.6
Two or three positions	13	6.4
How is your infant's bed?		
Hard	61	29.9
Soft	143	70.1
Do you use a pacifier when putting your infant to sleep?		
Yes	84	41.2
No	120	58.8
Do you cover your infant's head or face while he/she is sleeping?		
Yes	46	22.5
No	158	77.5
Are you breastfeeding?		
Yes	180	88.2
No	24	11.8
Do you use pillows while your infant is sleeping?		
Yes	156	76.5
No	48	23.5
Do you keep toys, cheesecloths, and other items in your infant's bed?		
Yes	58	28.4
No	146	71.6
Do you sleep in the same bed with your infant?		
Yes	20	9.8
No	129	63.2
Sometimes	27	27.0
Do you sleep in the same room with your infant?		
Yes	188	92.9
No	10	4.9
Sometimes	6	2.9
How is the sleep environment of your infant heated?		
Natural gas	171	83.8
Stove	33	16.2
Did you smoke during your pregnancy?		
Yes	6	2.9
No	198	97.1
Did you smoke during lactation?		
Yes	6	2.9
No	198	97.1
Are there smokers at home?		
Yes	80	39.2
No	124	60.8
Do you swaddle your infant when putting your infant to sleep?		
Yes	79	38.7
No	125	61.3

Of the mothers, 47.5% stated that they laid their infant in the supine position, 43.6% in the lateral position, 2.5% in the prone position, and 6.4% in two or three positions. It was determined that 70.1% of the babies slept in soft beds and 76.5% used pillows. A total of 22.5% of the mothers stated that they covered their infant's head or face while sleeping; 28.4% had toys, cheesecloths, etc. in the infant's bed; 41.2% used pacifiers while putting the infant to sleep; 9.8% of them slept in the same bed with the infant, and 92.9% slept in the same room. In total, 83.8% of the families resided in homes heated by natural gas. The breastfeeding ratio was 88.2%, the swaddling ratio was 38.7%, and the mean duration of swaddling was 3.09±1.64 months. When the smoking characteristics of the mothers were evaluated, it was found that the

smoking rate of mothers during pregnancy and lactation was 2.9%, and the ratio of smoking at home was 39.2%. All mothers stated that their babies had their regular vaccinations and controls and that they checked their infants while they slept.

When the practices of mothers for safe sleep according to sociodemographic variables such as mother's education level, working status, family type, and income level were evaluated; there was a significant relationship between the education level of the mother and bed-sharing and the use of pillows. Also, there was a significant relationship between family type and sleeping surface (p<0.05). The use of pillows and bed-sharing was found to be the highest among primary school graduate mothers and the use of hard beds in nuclear families (Table 3).

Table 3. Safe sleep practices according to mother's education level and family type

Practices	Educational status								Family type			
	Illiterate		Primary School		High School		University		Nuclear		Extended	
	n	%	n	%	n	%	n	%	n	%	n	%
Supine position												
Yes	4	57.1	45	51.1	28	45.2	20	42.6	80	46.5	17	53.1
No	3	42.9	43	48.9	34	54.8	27	57.4	92	53.5	15	46.9
<i>Test*/p</i>	<i>1.324/0.723</i>								<i>0.473/0.492</i>			
Sleeping surface												
Hard	3	42.9	22	25.0	21	33.9	15	31.9	57	33.1	4	12.5
Soft	4	57.1	66	75.0	41	66.1	32	68.1	115	66.9	28	87.5
<i>Test*/p</i>	<i>2.125/0.547</i>								<i>5.483/0.019</i>			
Using pacifier												
Yes	5	71.4	36	40.9	27	43.5	16	34.0	72	41.9	12	37.5
No	2	28.6	52	59.1	35	56.5	31	66.0	100	58.1	20	62.5
<i>Test/p</i>	<i>3.779/0.286</i>								<i>0.212/0.645</i>			
Pillow use												
Yes	7	100	70	79.5	53	85.5	26	55.3	43	25.0	5	15.6
No	0	0	18	20.5	9	14.5	21	44.7	129	75.0	27	84.4
<i>Test*/p</i>	<i>17.102/0.001</i>								<i>1.318/0.251</i>			
Bedsharing												
Yes	4	57.1	8	9.1	5	8.1	3	6.4	15	8.7	5	3.1
No	0	0	63	71.6	33	53.2	33	70.2	109	63.4	20	62.5
Sometimes	3	42.9	17	19.3	24	38.1	11	23.4	48	27.9	7	21.9
<i>Test*/p</i>	<i>29.498/0.000</i>								<i>1.679/0.423</i>			

Discussion

Mothers' safe sleep practices play an important role in reducing the risk of sudden infant death. In this study, mothers' practices about a safe sleep environment were discussed. One of the most important modifiable factors for a safe sleep

environment is keeping the infant in the supine position during all sleep periods. In the United States, the rate of SIDS decreased by 53% between 1992 and 2001 through a campaign promoting the supine sleeping position initiated in the 1990s (1). In this study, it was found that approximately half (47.5%) of

the mothers laid their babies in the supine position, whereas the other half (46.1%) laid their babies in non-supine positions. Mothers may prefer prone and lateral positions for the infant's comfort and the possibility of aspiration; however, these sleeping positions may increase the risk of SIDS by increasing the infant's body temperature, rebreathing the air in expiration, and leading to hypercapnia and hypoxia (27). Colson et.al (28) found that 77.3% of the mothers laid their infants in the supine position. Studies in Turkey found that the ratio of laying the infants in the supine position varied between 20% and 98% (13,15,18-20,29). The high rate of laying infants in the non-supine position may be owing to mothers thinking that the supine position causes aspiration in the infant, the recommendation of the lateral position by health personnel, and the lack of campaigns or educational programs in Turkey regarding the sleeping position for infants.

It is stated in the literature that sleeping on a soft bed increases the risk of SIDS owing to compression, choking, and prone positioning of the infant (1,7). In the present study, the rate of using soft beds was high (70.1%). In studies evaluating mothers' safe sleep practices, Erdoğan and Turan (19), Çalışır et al. (13), Alparslan and Uçan (12) found that 51%, 55.9%, and 21.9% of mothers put their babies to sleep in a soft bed, respectively. This result in our study and the literature may be owing to mothers thinking that the use of soft beds provides more comfort for the infant and the mothers' lack of adequate information regarding the risks of using soft beds.

Parents and caregivers can place materials such as blankets and pillows on the bed to prevent the infant from falling out of bed or becoming uncomfortable. It has been reported that pillows, quilts, and other soft materials are dangerous when placed under the infant or left in the sleeping area, and most sleep-related infant deaths are caused by suffocation involving pillows, quilts, and other materials (1,27). It was determined that three-fourth of the mothers used pillows (76.5%) and one-fourth (28.4%) placed items such as toys and cheesecloths in the infant's bed in the present study. Similar results have been obtained in

other studies (16,18-20,29). In terms of a safe sleeping environment, it is recommended that soft objects such as pillows, toys, and covers not be kept in the sleeping area owing to the risk of suffocation and entrapment of the infant (1).

Covering the head or face during sleep may be risky owing to overheating, hypoxia, or rebreathing of expired air (1,30). In the present study, it was found that 22.5% of the mothers covered their infants' heads or face while sleeping. In our country, the practice of covering the face of the infant, which is considered a traditional practice to protect babies from surrounding hazards, varies between 21.9% and 49.3% in different studies (12,13,15,18). In the present study, it was determined that 83.8% of the rooms where infants slept were heated by natural gas. Efe et al. (15) found that 74.9% of the infants resided in stove-heated houses. The American Academy of Pediatrics (AAP) recommends that for a safe sleeping environment, the room temperature not be excessively increased and that the room be ventilated (1).

An infant sleeping with an adult in a sleeping area that is not suitable for the infant, such as a bed or sofa, is defined as bed-sharing (31). In recent years, sudden infant deaths due to bed-sharing in high-risk sleep environments (sofa, armchair, etc.) have been reported to increase (1). In the present study, it was determined that 36.8% of the mothers slept in the same bed with their babies every night or occasionally. In previous studies, Erdoğan and Turan (18) found that 28.5% of mothers shared the bed with their infants, another study by Erdoğan and Turan (19) found that 42% shared the bed with their newborns, and Efe et al. (16) found that 56.5% shared the bed with their infant. Parents prefer bed sharing for a variety of cultural and personal reasons, such as breastfeeding and ease of attachment (31,32). However, it has been found that bed-sharing increases the risk of SIDS by 2.8 times owing to overheating, rebreathing of air, obstruction of the airway, covering the infant's head, and exposure to cigarette smoke (1,31). Certain studies describe that bed-sharing is a cultural practice, and practices such as soft bed use and laying the infant in the prone position are correlated with bed-sharing (32,33). Room sharing

without bed-sharing has been reported to be safer and to reduce the risk of SIDS by 50% (1,9). In the present study, the high rate of room sharing (92%) is a positive finding, and we recommend that this practice be supported.

Smoking during pregnancy and exposure of the infant to smoking at home is a major risk factor for SIDS. This is because exposure to cigarette smoke increases the risk of premature birth and low birth weight, which are considered risk factors for SIDS, and negatively affects the infant's stimulation. It is estimated that one-third of all SIDS deaths can be prevented by avoiding smoking during pregnancy (34,35). It was found that the majority of mothers (97%) did not smoke during pregnancy and breastfeeding; however, the rate of smoking at home was 39.2% in this study. Similar to our study, the rate of smoking at home was found to be 40.8% by Erdoğan and Turan (18) and 48.7% by Çalışır et al. (13). The American Academy of Pediatrics (1) recommends the prevention of prenatal and environmental exposure to cigarette smoke.

It has been reported that breastfeeding has a protective effect against SIDS in addition to the several benefits in terms of mother and infant health (1,24). In the present study, the breastfeeding rate was 88.2%. A similar result was obtained in another study (18). Although the effect of pacifiers on breastfeeding is controversial, it has been stated that it has a protective effect against SIDS as it modifies autonomic control during sleep and maintains the airway opening. For safe sleep, the use of a pacifier and the continuation of breastfeeding are both recommended (1). In the present study, 41.2% of the mothers stated that they used pacifiers while putting their infants to sleep. This result in our study was lower than those obtained in other studies (16,18,20). It is believed that the mothers' lack of adequate information regarding the effects of pacifier use on SIDS and breastfeeding had an impact on these results.

Swaddling, which is traditionally used in many countries and cultures as part of infant care, is a common practice in Turkish society (36). Swaddling calms the infant and facilitates sleep, and it may even

be a practice that encourages sleep in the supine position if done correctly; however, there is not enough evidence showing that it reduces the risk of SIDS (1,37). In the present study, 38.7% of the mothers stated that they swaddled their infants for an average of 3 months while putting them to sleep. Because the risk of SIDS increases when the infant is swaddled in the prone position, it is recommended that the swaddle be performed in the supine position and terminated with the onset of turning movements by the infant (1,38). It was found that all infants were regularly vaccinated and checked by their parents while sleeping in the study. The literature describes that vaccination may have a protective effect against SIDS and recommends routine vaccinations (1). Vennemann et.al. (39) reported that the risk of SIDS decreased by 50% with immunization. Training can be provided to parents regarding the importance of vaccines and regular vaccination.

It was determined that the level of mother education and family type affected safe sleep practices such as bed-sharing, pillow using and sleep surfaces. Various studies conducted in Turkey; Alparslan and Uçan (12) with sleep surface between family type; Çalışır et al. (13) found a significant difference between mother education and bed-sharing. These results can be interpreted as the education level of the mothers significantly affect their safe sleep practices.

Limitations: The findings of this study can be generalized only to the sample group. This study did not cover all mothers. Risk factors should be investigated in a larger sample. Intervention studies can be planned in which observations, follow-ups, and training activities are carried out regarding this subject.

Conclusion

The present study determined that mothers had risky practices related to the sleep environment, particularly regarding the use of soft beds, sleeping positions, pillow use, and bed-sharing. Therefore, it can be recommended that parents and babysitters be provided with training on a safe sleep environment during the check-up and follow-up visits performed in

family health centers and hospitals in the prenatal period. In addition, the knowledge and awareness of health professionals regarding safe sleep should be

increased. Training programs and campaigns for safe sleep can be organized by pediatric health and community health workers across the country.

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